

Depression and its influence on memory performance in a group of older adults attending the gerontogeriatric center in the state of Durango

La depresión y su influencia en el rendimiento de la memoria en un grupo de adultos mayores que acuden al centro gerontogeriatrico del estado de Durango

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Abstract

Depression is a common disorder in old age, because when they reach this age they stop producing different types of neurotransmitters such as: norepinephrine and serotonin. This is affecting the state of memory, as the brain undergoes important changes and working, episodic, context and prospective memory. The elders decide to remember important events, putting aside their reality. Objective: To know the impact that depression has on memory performance within a population of older adults through clinical evaluations. Methodology: Cross-sectional, quantitative, descriptive and correlational research. Contribution: In a scale of 12 participants, it was obtained that adults over 75 years of age, even if they take cognitive stimulation programs, no longer benefit their cognitive abilities, since moods such as depression and anxiety directly affect said functions and Skills.

Depression, Old age, Memory

Resumen

La depresión es un trastorno común dentro de la vejez, pues al llegar a esta edad se dejan de producir diferentes tipos de neurotransmisores como lo son: noradrenalina y serotonina. Afectando así el estado de la memoria, pues el cerebro se somete a cambios importantes y la memoria de trabajo, episódica, de contexto y prospectiva. Los ancianos deciden recordar eventos importantes, dejando de lado su realidad. Objetivo: Conocer el impacto que tiene la depresión en el rendimiento de la memoria dentro de una población de adultos mayores por medio de evaluaciones clínicas. Metodología: Investigación transversal, cuantitativa, descriptiva y correlacional. Contribución: En una escala de 12 participantes se obtuvo que el adulto mayor a 75 años, aunque lleve programas de estimulación cognitiva ya no beneficia a sus habilidades cognitivas, ya que los estados de ánimo como la depresión y la ansiedad afecta directamente a dichas funciones y habilidades.

Depresión, Vejez, Memoria

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Introduction

According to Molina (2010), the most frequent disorder in old age is depression. Moreover, it is one of the leading causes of disability, entailing a high economic cost and significant suffering. Thus, depressive disorders interfere with daily functioning, causing pain and suffering, not only to patients, but also to their families. This condition increases even more in old age, affecting the brain and causing an alteration in the hippocampus, where memories and memory are processed.

Memory is the capacity that allows us to remember facts, ideas, sensations, relationships between concepts and all kinds of stimuli that occurred in the past. It becomes one of the cognitive functions most commonly affected with age.

Fortunately, memory can be trained through cognitive stimulation with various types of mental games (Cognifit, 2022).

To carry out this research, we went to the "Caring for those who give us life" geriatric centre in the state of Durango, where 12 elderly people of different ages from 65 to 85 years of age were evaluated. In this format, different tests were carried out, such as the Minimental test and the BECK scale, to qualify and evaluate the parameters in which each research subject is found, and appropriate information was also gathered from different authors in order to be able to support this study.

Justification

On the contrary, depression is one of the most frequent psychiatric syndromes and probably the second most disabling disorder in the elderly population, as these patients are subject to biological, psychological, economic and social changes and are associated with numerous diseases such as memory loss, due to their age (Martínez, 2007, p. 01).

It should be noted that depression (present in 24% of older adults according to the SABE survey) can inhibit functions such as attention and memory, to the point of constituting so-called "pseudo-dementia". The diagnosis of these conditions is very important because treatment can achieve a total improvement (Donoso, 2022. p.02).

Now, within the functioning of memory in the elderly, it is known that this cognitive ability is one of the main functions of the brain and its objective is to collect and store information from the external world, to evoke it when necessary. (Donoso, 2022, p.01).

However, memory loss is one of the greatest threats to the ageing brain. Indeed, although brain diseases that cause memory failure can appear at any age, they are more frequent in older adults. These diseases include Alzheimer's disease, mild cognitive impairment, vascular lesions, the effect of drugs and emotional disorders.

In some cases the cause of this deterioration may be an emotional disorder, reversible with appropriate treatment; in other cases it may be due to a combination of drugs or alcohol; in still other cases it may be a very early Alzheimer's disease.

Non-pharmacological therapies have therefore proven to be effective in the recovery of cognitive impairment. They are useful for the treatment of neurodegenerative diseases, for patients with memory complaints typical of normal ageing and for cognitive impairments triggered by brain damage of various origins (Sardinero, 2010, p 17).

The list of therapy modalities is extensive, including reality orientation; reminiscence; validation; behaviour modification; psychomotor skills; integral psycho-stimulation; music therapy, etc. Each approach is supportive of the others, and rather than competing, we consider that each one brings a distinct benefit to the patient.

In terms of prevalence, Martínez (2007) indicates that, according to the most recent WHO data, 25% of people over the age of 65 suffer from some type of psychiatric disorder, the most frequent being depression, up to the age of 75. Estimates of the prevalence of major depression in older people are 2-4 % in community samples, 12 % in patients hospitalised for medical illness and 16 % in chronically treated geriatric patients. (p. 02)

The Human Communication professional as a caregiver and health educator has the possibility to create preventive measures and early diagnosis, so the present study was conducted with the purpose of knowing the association between depression and cognitive function of memory to guide the planning of therapeutic intervention strategies.

Problem

The growth of the older adult population has highlighted the health problems related to ageing, and among them, psychiatric disorders (Navas, 2013 para,01).

Depression has a number of negative consequences on the comorbidity and functional capacities of the elderly. Consequences include higher morbidity rates, physical and social disability, poorer prognosis for early recovery and increased use of hospital services. (Navas, 2013 p,04)

Early diagnosis is essential in order to provide timely treatment with the aim of reversing the condition and preventing the onset of serious complications. Treatment should be interdisciplinary and, when opting for the use of drugs, the physiological changes associated with the ageing process should be considered for their correct administration. (Navas, 2013 p,06)

Hypothesis

H1: "Depression influences the memory status of older adults".

H0: "Depression does not influence memory status in older adults."

General objective.

- To identify the association between depression and memory in a population of older adults. To guide therapeutic planning.

Specific objectives

- To identify the current state of depression in a group of older adults using the BECK scale.

- To find out how the memory ability is in a group of older adults by means of the Minimental Test.

Theoretical framework

Background

The author Duran (2015) states that depression leads to cognitive impairment, conditions that should be identified for timely detection and prevention of damage. He used a descriptive-cross-sectional-correlational study method in 252 older adults of both sexes.

Instruments:

Yesavage test (sensitivity 84% and specificity 95%) and Mini-mental State Examination (sensitivity 82% and specificity 84%). Analysis with SPSS version 18, using Spearman connections.

The results were 40.1% without depression, 3.9% with mild depression and 25% with established depression; as well as 58.3% with full cognitive function and 41.7% with cognitive impairment. Negative correlation between depression and cognitive function ($r_s=0.242$; $p=0.000$).

Therefore, the author Garcia (2014) despite the cognitive decline that occurs with age, numerous studies have demonstrated the effectiveness of memory training programmes in improving various neurocognitive areas in older people. Objective: to analyse, in a preliminary way, the differential effect of two memory training programmes in elderly people on various cognitive functions.

Methods: 18 subjects between 61 and 81 years of age participated in either a memory strategy training programme or a training programme for everyday forgetfulness. Subjective perception of memory and cognitive performance before and after training were assessed in all of them.

Results: a statistically significant improvement was found in the subjective memory complaints questionnaire in both groups, and only some improvement in visuospatial working memory (inverse Corsi test) and reasoning (Analogies) was found in the group that received training in everyday forgetfulness.

Conclusions: memory training programmes improve older people's subjective perception of memory functioning, and this is independent of the training methodology used.

Finally, the following author Rodriguez (2021) argues that depression in older adults has been associated with cognitive decline as a result of the possible negative effects of emotional symptoms on cognition. Objective: to determine the impact of depression on the cognitive functioning of older adults attending grandparents' homes numbers two and three in the municipality of Holguín.

Methods: from a quantitative approach, a descriptive study was conducted between May 2019 and March 2020. The universe consisted of 50 older adults attending grandparents' homes numbers two and three in the municipality of Holguín.

The sample was selected probabilistically and was made up of 26 older adults. Socio-demographic variables, depression and cognitive functioning were considered as variables. The semi-structured interview, the mini-mental state examination, the Clock Test, the Montreal Cognitive Assessment and the Yesavage geriatric depression scale were used in the evaluation. Results were processed in the EPIDAT 3.1 and MedCalc packages.

Results: Significant differences between groups were evident on the mini-mental state test and the Montreal Cognitive Assessment. Participants with depression scored significantly lower on the cognitive domains of the Montreal Cognitive Assessment.

Conclusions: Depression had a negative influence on the cognitive functioning of older adults. The presence of depression affected the interpretation of the Montreal Cognitive Assessment.

Older Adults

Population ageing is one of the greatest achievements of humankind, but at the same time it is one of the greatest challenges today. Ageing is an inevitable and gradual process that manifests itself mainly in biochemical, physiological, morphological, social, psychological and functional changes as a consequence of the action of time on people. However, not all people age in the same way. (Escorchez, 2007 p.01)

Their development and ageing process are the result of the interrelation between "genetic information" and all the natural and socio-cultural variables that constitute the "environment" in which human life develops from birth to death.

Therefore, when considering a person's age, it is necessary to take into account the physical, biological, functional and social conditions that he or she manifests. Hence, we can distinguish between chronological age, biological age, psychological age and social age (Escorchez, 2007 p.01).

[Chronological age, which refers to the years of a person's life. Biological age, which refers to the person's position in relation to his or her life expectancy. Psychological age, which refers to the person's ability to cope with and adapt to social and environmental demands. And social age, which refers to the dominant social and cultural representation of old age. Hence, a more appropriate way of identifying the appropriate age of an older person is biological age in interaction with psychological age and social age (Escorchez, 2007 p.6).

Cognitive decline in the older adult.

With the increase in life expectancy, age-associated diseases will increase, among which cognitive impairment without dementia and dementia represent conditions that directly affect the quality of life of the older adult population and determine a greater use of health services.

Cognition in general terms is understood as the intellectual functioning that allows us to interact with the environment in which we live. With ageing, morphological, biochemical, metabolic and circulatory changes occur in the brain in a normal way. Depending on brain plasticity and the redundant activity of many brain functions, these changes can lead to cognitive alterations or continue their normal function.

The morphological changes that occur are loss of volume and thinning of the frontal cortex which has a fundamental role in attention and executive functions; decrease in neuronal volume which is not uniform, synaptic changes and in the dendritic extensions of the pyramidal cells that decrease in number and size; decrease in neurotransmitters and decrease in the number of receptors especially in neurodegenerative diseases, there is a decrease in cerebral blood flow and oxygen consumption in arteriosclerosis, but remain unchanged in ageing in healthy patients.

Alterations in memory are due to changes in the frontal-striatal circuits that appear to be involved in the process of memorisation and memory formation. These changes are related to normal cognitive ageing, which is difficult to define because the associations of cognitive function and age are not necessarily linear, as well as having multiple influences such as those related to health status and the type of cognitive function assessed.

Generally speaking, around the age of 60 years, there is a decline in memory, verbal fluency, mathematical logic, and efficiency and speed of analysis. However, cognitive decline, defined as the loss of cognitive functions, depends on both physiological and environmental factors and is subject to great inter-individual variability, the maintenance of cognition in the elderly patient is linked to variables such as the patient's pathologies, social support, mood and the presence of geriatric syndromes such as frailty and osteopenia. (Benavides, 2017 p,108)

Depression

Depression tends to be more prevalent in older people, those with chronic or severe somatic illnesses and in women, at a ratio of 2-3 women to every man. Symptoms and clinical signs of depression can be arranged as follows (Retamal, 1999 p, 9).

- Emotional disturbances: pathological sadness, anguish and irritability.
- Thought disturbances: concentration and memory failures, disinterest, indecisiveness, hopelessness, delusional ideation, suicidal ideation.
- Somatic disturbances: insomnia, hyperinsomnia, anorexia, hyperphagia, anorexia, weight loss or gain and fatigue.
- Alterations in vital rhythms: now certain times of the day, usually in the morning, seasonal season of symptoms.
- Behavioural disturbances: crying, agitation, lethargy, isolation, mutism.

The causes of depression are multiple. It is reasonable to suggest that there is usually a multi-causality, being frequent to find that from a certain biological predisposition (heredity, hormonal and biochemical alterations) and biographical (pre-depressive or melancholic personality style) the symptoms are triggered in coincidence with environmental situations and conflict, failure or losses (Retamal, 1999 p, 11).

Clinical picture

The characteristics of depressive disorder described in the DSM IV-TR correspond to the presentation of the clinical picture in elderly patients. However, there are some variations in this group. Depressive affect, a typical symptom of depression, is reported less frequently by depressed elderly people than by younger patients (Peña, 2009, pp 7).

Depression tends to present with more melancholic features and in general appears to be more severe in older adults. However, on scales measuring patients' subjective appraisal of their depression, lower scores have been found than in younger people. This is probably due to the tendency for older people to accept depressive symptoms as "(Peña, 2009, p 07).

Prevalence

Depression in the elderly is a major health problem, it can be considered as the most frequent psychiatric illness in the elderly in developed countries, and is associated with suffering and increased prevalence and poor outcome of health problems. The prevalence of depression in the elderly is 13.5% worldwide. However, in a European study of people living in the community it is 12.3%, although there are differences between Eastern and Western countries, while in the case of Spain it is 14%. The prevalence of major depression (recurrent episodes) in older adults living in the community is between 1 and 5% (Millares, 2019, pp 7).

Memory

Memory is one of the main functions of the brain and its purpose is to collect and store information from the external world, in order to evoke it when necessary. The substrate of memory is a functional system, in which various brain areas participate, each of which makes a relatively specific contribution to normal function (Donoso, 2022, p 01).

By way of example we can say that the hippocampus (on the inner side of the temporal lobes) is essential for retaining information about what is happening at that moment; that the left temporal lobe is important for verbal memory and the right for visuospatial memory; that the prefrontal areas are important for establishing memorisation or recall strategies; that the left parietal lobe stores acquired motor skills.

By saying that the prefrontal areas are important for establishing memorisation strategies, we are saying that memory is not a passive recording of what happens around us, but an active process, in which the person decides what he or she wishes to remember, what to direct his or her attention to in order to keep it.

Something similar happens when recalling, one remembers better what interests him/her, and the organisation of memories depends on the purposes of the moment (Donoso, 2022, p 01).

Types of memory

- Sensory memory (SM):

Records information that comes from the external environment (images, sounds, smells, tastes, and the touch of things) for a very short time (one second), but long enough for that information to be transmitted to the SCM. The SM scans the physical characteristics of the stimuli and records the sensations. The physical features of the stimuli, their shape, colour, intensity, are decisive in the recording of information.

The capacity of the MS is large and there is a subsystem for each sense. Iconic memory records information in the form of icons (pictures or figures) and echoic memory records sounds and words. The duration of the information depends on the sense. In echoic memory the information remains for two seconds, while iconic memory stores the information for one second. If the information that reaches the sensory memory is not transferred to the SCM, it decays quickly (Piragauta, 2014, p 140).

- Short-term memory (STM)

Information stored in sensory memory is partly transferred to short-term memory, before being passed to long-term memory. The function of the The function of the SCM is to organise and analyse information (recognising faces, remembering names, answering a test, etc.) and to interpret our experiences.

It is a working memory that integrates all the knowledge and memories that matter in the present situation and for future problems. The storage capacity of the SCM is limited; it cannot retain more than seven items at a time, and that is if it is not distracted while recording them. Short-term memory memories can be altered by new experiences. The temporal duration of information in SCM is short, between 18 and 20 seconds (Piragauta, 2014, p 141).

- Long-term memory (LTM)

Long-term memory contains our knowledge of the physical world, of social and cultural reality, our autobiographical memories, as well as language and the meanings of concepts. Here information is well organised, making it easy to access when appropriate. The information in the MLP is semantic when the material is verbal, and visual when it is in the form of figures or graphics. The semantic code allows meaningful relationships to be established between the diversity of stored knowledge.

The MLP has unlimited capacity, there are no known boundaries to the information that can be deposited in it, but it does not guarantee its retrieval. In a large library, a misplaced book is a lost book. The organisation of information for retrieval is also crucial. But long-term memory has a life of its own: it remembers as well as forgets things involuntarily. In terms of duration, it is a stable storage structure and its contents are maintained for a few minutes, several years or the entire life of the individual. (Piragauta, 2014, p. 140).

- Clinical picture of memory

Neuroimaging studies in elderly people have shown that brain volume decreases overall, cortical thickness decreases and the ventricular system expands. These brain changes have been linked to the cognitive decline that accompanies old age. In general, older people show poorer performance than younger people in different learning and memory tasks (Martí-Nicolovius, 2018, p 415).

In general terms, the type of memory that is most affected in older adults is long-term and episodic memory. Regarding long-term memory, the main problems appear in a relational type of memory, episodic memory, which consists of the ability to remember specific recent experiences and which depends critically on the integrity of the hippocampus and adjacent structures of the medial temporal lobe. (Martí-Nicolovius, 2018, p 415).

Assessment

It is the process in which, under specific parameters, a conclusion is reached about a person, aspect, situation.

It is very useful in the life of the human being as in sciences, arts and multiple human activities. As a result, an individual or group can construct an idea about what has been analysed (Martínez, 2019, pp 02).

To carry out this process, the evaluation criteria must be clear, which are the objective rules that define the evaluation process. These can be focused on the verification of the assimilation of a concept, observation in problem solving and establishing the degree of internalisation of knowledge (Martínez, 2019, pp 03).

Beck depression test

The Beck Anxiety Inventory is a useful tool for assessing somatic symptoms of anxiety in both anxiety disorders and depressive conditions. The questionnaire consists of 21 questions, providing a range of scores between 0 and 63. The suggested cut-off points for interpreting the result obtained are as follows:

- 00-21 - Very low anxiety.
- 22-35 - Moderate anxiety
- more than 36 - Severe Anxiety

Each item is scored from 0 to 3, with score 0 corresponding to "not at all", 1 to "mildly, it does not bother me much", 2 to "moderately, it was very unpleasant, but I could stand it" and score 3 to "severely, I could hardly stand it". The total score is the sum of all items. The symptoms refer to the last week and the current time. In the questionnaire there is a list of common symptoms of anxiety. Read each item carefully, and indicate how much it has affected you in the last week including today (Beck, 1971, pp 01).

Minimental

According to Revilla (2014), this is a practical method that allows us to establish the degree of the patient's cognitive state and to be able to detect dementia or delirium. The essential characteristics that are evaluated are: (pp, 07)

- Temporal and spatial orientation. (10 points)
- o Ability to fixate, pay attention and calculate. and calculation. (8 points)
- o Memory. (3 points)

- Naming, repetition and comprehension (6 points).
- Reading, writing and drawing (3 points).

For marking, the practitioner shall: Score each answer, according to the instructions provided. Then add up all the points obtained by the patient, the maximum is 30 points. Find the total score obtained in the correspondence table (Revilla, 2014 pp, 11).

- 27 points or more: Normal.
- 23 points or less: Pathological suspicion.
- 12-23 points: Impairment - 9-12 points: Dementia.
- Less than 5 points. Terminal stage. Totally disoriented. Does not recognise himself. Incoherent. Prostration (Revilla, 2014 pp, 12).

When items have been omitted due to the impossibility of performing them, the score should be weighted, applying a simple rule of three, as an example: A patient who, due to incapacity, cannot perform the following tests: nomination, reading and writing, will opt for a maximum score of 27 points, if they obtain 24 points; the corresponding correction will be made: $24 \times 30/27 = 26.67$, and then by rounding we obtain the nearest whole number, in this case 27 points, which should be interpreted as a normal score out of 30 points (Revilla, 2014 pp, 11)

Research methodology

The present study was descriptive, cross-sectional and correlational, with older adults in the geronto-geriatric centre in the state of Durango. The population under study was attended by resident students and teachers from the Faculty of Psychology and Human Communication Therapy of the UJED.

The sampling was non-probabilistic, by convenience, due to the lack of a sampling frame that would allow it to be carried out randomly. The sample consisted of 12 older adults of both sexes.

Participants were over 60 years of age, who at the time of the study did not have a diagnosis of depression. Both the Beck Depression Test, which consists of 21 questions, providing a range of scores between 0 and 63, and the Minimental Test, which assesses the degree of the patient's cognitive state and evaluates the areas of Temporal and spatial orientation, fixation, attention and calculation, memory, nomination, repetition and compression, reading, writing and drawing, were applied.

On the other hand, the Beck Depression Rating Scale consists of 21 questions that show the current state of feeling of the adults. Each of the different tests were selected because they meet the objectives sought to be evaluated in this work, and they all complement each other in order to contemplate the aspects that are important or that may be involved in executive functions.

Lastly, a clinical interview was conducted, with personal questions that each of the subjects had to answer, such as: What is your name? How old are you? Up to what grade did you study? Where and on what day were you born? How many children do you have?

To classify the information collected through the application of the evaluations, we proceeded to score each of the batteries and create a database in the Excel programme, which will help us to keep the information ordered and structured, so that we can find the data easily and adapt them to our objectives and needs.

Results

The sample consisted of 19 elderly people (women =16, men =3) with an average age of 79 years who attend the Gerontogeriatric Centre. In the description of the results of the Beck scale, 79% of the elderly population was found to be in a state of depression that requires the intervention of a mental health professional. Furthermore, of the 79% of the population with depression, 60% require the intervention of a psychiatrist to improve their mental health [Figure 1].

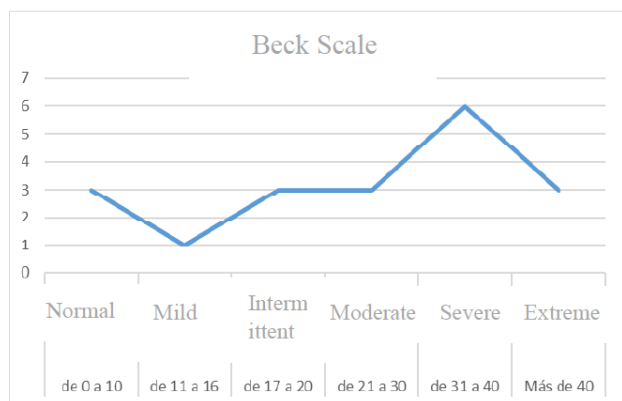


Figure 1 Beck scale.

All this resulted in a moderate positive correlation between age and depression in the elderly ($r^2 = 0.40$), which means that the older the person is, the greater the probability of suffering from depression. (Figure 2)

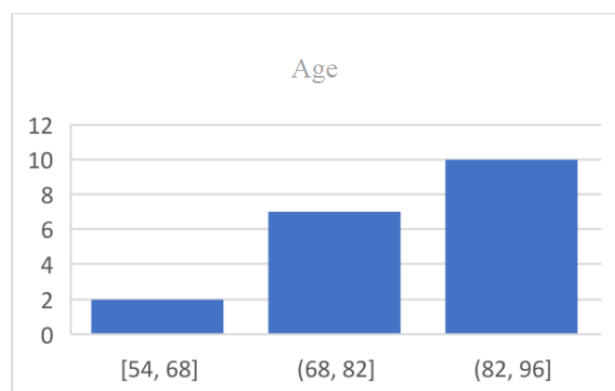


Figure 2 Correlation between age and depression in older adults

There is no correlation between age and memory ability in older adults, as they are independent variables, since it depends on the educational and cognitive level of each person. [Figure 3].

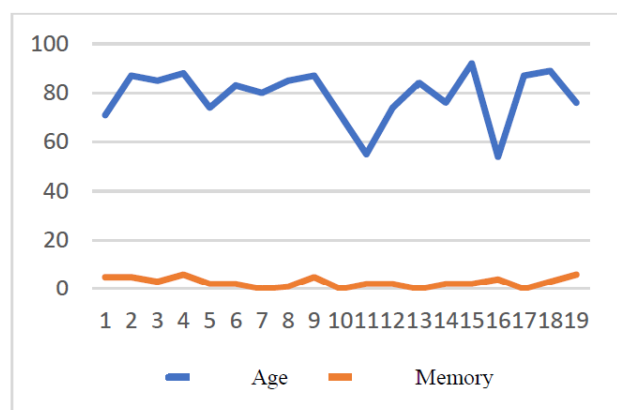


Figure 3 Correlation between age and memory in the older adult.

After analysing the statistical data, the alternative hypothesis is accepted since, based on the results, depression does affect the memory status of older adults, with a $t=1.73$ at 95% reliability.

Within the depression studies previously investigated, according to Calderón (2018), the result was that in the country of Ecuador, 39% according to the SABE survey (Health, Wellbeing and Ageing) from the age of 65 years, depression has its own factors such as the diseases they suffer, the environment in which they live, social situation and even some demographic factors such as work, marital status, among others; while in Mexico its overall prevalence is 9.5% in women and 5% in men over 60 years old (Pérez, 2014).

Likewise, in the memory study, the results show that the executive functions that are most affected over the years are attention, working memory and verbal fluency, involved in the search for and updating of information (Lepe, 2020).

Conclusion

According to the statistical tests it was shown that: within depression there is a moderate positive correlation between age and depression in older adults. Therefore, the intervention of a mental health professional is suggested.

On the other hand, in the state of memory, no correlation was shown between age and memory ability, as it depends on their cognitive state.

While depression does have an influence on memory in older adults in the State of Durango.

It is important to consider that the elderly population is not provided with psychological care and cognitive stimulation, so these factors tend to develop more quickly, leaving a great problem for the elderly.

It is therefore recommended that when they reach the age of 60, they should take cognitive stimulation workshops, receive care from a mental health specialist, eat well and be accompanied by an elderly person, so that they can live a peaceful old age.

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